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ORIGINAL ARTICLES.

RADIOGRAPHY OF THE CHEST IN TUBERCULOSIS.

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Much has been written on the study of pulmonary tuberculosis by means of the X-ray screen and film. The subject is not yet exhausted, however, and it continues to be one of great interest to the radiologist. When there is a clear clinical history and tubercle bacilli are known to be present, it is not difficult by radiography to assess with some degree of accuracy the amount of damage that has been done to the lungs. But it is when the history is unknown or indefinite and the physical signs are not sufficient to establish a diagnosis that the radiographic examination becomes most important and is of greatest interest.

It is questionable whether radiography can detect what is, in the pathological sense, early tuberculosis. By the time the changes induced by the morbid processes have reached such proportions as to be demonstrable on a fluorescent screen or detected in a film the disease is usually well established. But it sometimes occurs that by indicating changes in definite areas of the lung fields the radiologist may be of material help to the clinician, and it rarely happens that a film will fail to show confirmatory evidence of disease when the physician has found even doubtful signs.

When the result of the examination of a suspected case is inconclusive, arrangements should be made for the patient to return in a few weeks' time, when a further film should be taken. It happens not

infrequently that the second film will show sufficient evidence to place the diagnosis beyond dispute before definite physical signs can be determined, a group or chain of small delicate opacities being discovered in the deep part of a lung, usually extending out from the hilar region. It is possible for tuberculosis to involve the hilar region and invade the lungs for a considerable extent without giving rise to obvious physical signs. The process in such cases appears to be slow and accompanied by some degree of fibrosis in and around the diseased area, the shrinking induced by the fibrosis being associated with a stretching of the surrounding lung tissue. There is thus formed a region of localized emphysema which acts as an air cushion, modifying the percussion note, and preventing the conduction of sound to the stethoscope. Such a case is illustrated in Fig. 1.

When it is established that a patient is suffering from pulmonary tuberculosis, although, as a rule, it is on the general clinical condition that the progress of the case must be judged, films taken at intervals provide valuable help in estimating the changes in the lungs. Fig. 2 represents a case of chronic tuberculosis, which, after two years' quiescence, gave clinical evidence of extension in the right base. Films taken at intervals during the quiescent period all showed the changes in the whole of the right highest lobe and the inner part of the left, with involvement of the hilar regions, and thickening of the upper right interlobar pleura and that of the outer chest wall adjoining. The dense caseation at and below the right hilum suggested the possibility of other disease, but it showed no obvious alteration with time. Emphysema compensating for fibrosis in the diseased areas is seen in the upper part of the chest and in the lowest part of the bases. The extensive invasion of the middle part of the right base was quite recent, and shows little evidence of fibrosis and none of localized emphysema.

How does Intra-Thoracic Tuberculosis Begin?

In children suffering from debility, particularly after such illnesses as measles, pertussis, or one of the acute inflammatory diseases of the chest, enlarged glands are frequently detected at the lung roots and tracheal bifurcation, with two or three smaller glands associated with the larger bronchi. These may appear discrete or may be more or less surrounded by opacity due to vascular engorgement or some degree of inflammatory infiltration. The course of one or more of the larger bronchi may be more clearly defined than in the normal, the shadow being due to the infiltration of bronchitis or to engorgement of a vein from pressure at the lung root. Almost invariably in such cases pea-sized glands can be felt behind the sterno-mastoid muscles. As the child's health improves, the opacity diminishes, and the gland shadows stand out more clearly, and later diminish in size. In still

later stages the glands may become calcified, remaining as opaque spots surrounded by a permanent reticular shading, which is regarded as localized fibrosis. The vast majority of these cases clear up ultimately, and do not necessarily develop further chest disease; they should not therefore be regarded as cases of pulmonary tuberculosis.

But in some patients, as time goes on, the glands become larger, and may show variations of density, which suggest the possibility of caseation. These should be regarded as tuberculous, for even if under treatment the process should become arrested, it seems probable that many cases of pulmonary tuberculosis developing in adolescence or early adult life result from extension of or dissemination from foci which have remained latent in such glands. When glands of this type are recognized in a child, careful examination should be made in certain areas—viz., the outer part of the infra-clavicular regions, the apices of the lowest lobes, the true apices of the lungs, the upper part of the upper bronchial area about 1½ inches below the clavicle, and the outer part of the bases of the upper lobes—for evidence of disease in the lungs. Fig. 3 is a film of a boy under seven years showing typical glands at the right hilum, with involvement at the apex of the right base. At the left side, level with the hilum, but far out in the lung, is an area showing a group of steamy opacities, ill-defined as a puff of smoke, and apparently joined together by a faint network. These in all probability represent a group of minute granulomatous nodules, each surrounded by a zone of reaction of broncho-pneumonic character, the network being due to disturbances in the lymphatic and vascular flow in the region of the nodules. Such shadows, although very suggestive, are not in themselves pathognomonic, and before coming to a conclusion, it is desirable to confirm their presence after allowing sufficient time for a non-tuberculous process to clear up. But the presence of such a group associated with the glands should give rise to grave suspicion, and the child should be placed under treatment and observation. Almost invariably, in addition to the network about the nodules, lines of relatively increased shading can be detected running an irregular course from the root to the affected area, and when viewed on the screen there is a failure of the affected part to light up on inspiration. This is particularly noticeable when the apices are involved, and while it may be due in part to an effort of nature to keep the area at rest, it is probably partly accounted for by the presence of inflammatory changes in the connective tissue of the bronchioles. Retraction of the apices is a later phenomenon, resulting from fibrosis and cicatrization.

In the adult the most frequent site for the earlier opacities is said to be below the outer end of the clavicle, although the true apex is often attached. It is undoubtedly the case that these regions are very

frequently involved when tuberculosis is established, and it may be difficult or impossible to trace a connection to the lung roots in the film. In a series of suspected adult cases, however, which, although showing neither physical nor radiological signs, were kept under observation, the characteristic opacities were first detected in an irregular chain extending outwards and upwards from the lung root where old glands were evident. Tuberculosis of the distal portions of the lung, without the presence of shading suggesting disease at the root areas, is almost never seen.

How does Intra-Thoracic Tuberculosis Extend?

If the infection is limited, or if the patient's resistance is high, the opacities may remain discrete, gradually becoming smaller and more opaque as the indefinite shadow of the minute surrounding zone of inflammation is replaced by the more definite shadow of a cicatrizing zone of fibrous tissue. Each nodule may undergo caseation and ultimate calcification as a separate entity.

Extension of the disease is marked by the appearance of successive groups of faint opacities, either in the vicinity of those first seen or in other parts of the chest. It must not be forgotten that their appearance is the sequel and not the antecedent of the actual dissemination of the bacilli; they are to be looked for when the patient shows signs of malaise or progressive ill-health. The opacities may involve only a few lobules, or any area up to a whole lobe. They are at first small, and may remain so; but if the disease is acute, and there is much pneumonic reaction round the nodules, the opacities may increase rapidly in size. They may become confluent, or may appear so from super-imposition of the shadows from the granulomatous masses in different planes of the lungs. Broncho-pneumonia or lobar pneumonia may complicate the picture, giving rise to large dense shadows, which may subsequently partly clear. In true miliary tuberculosis the whole lung picture may become opaque.

In the more chronic types the opacities appear to increase in numbers for a time, and gradually become merged in a large diffuse shading, which marks the process of exudation in the diseased area—the appearance seen in the right lowest lobe in Fig. 2. As consolidation proceeds two other processes begin. Caseation occurs, at first in individual nodules, but slowly extending by the confluence of the nodules so as to involve larger areas, which appear as irregularly shaped opacities; and following the leucocytic infiltration, hyperplasia of the connective tissue leads to fibrosis in the vicinity of the caseation, with the greater density of the fibro-caseous area. Caseation once established may remain unchanged over long periods, or may come to show more or less absolute opacity due to calcification. But such a

FIG. 1

CHRONIC HILAR TUBERCULOSIS IN A MAN AGED 34, GIVING RISE TO ALMOST NO PHYSICAL SIGNS

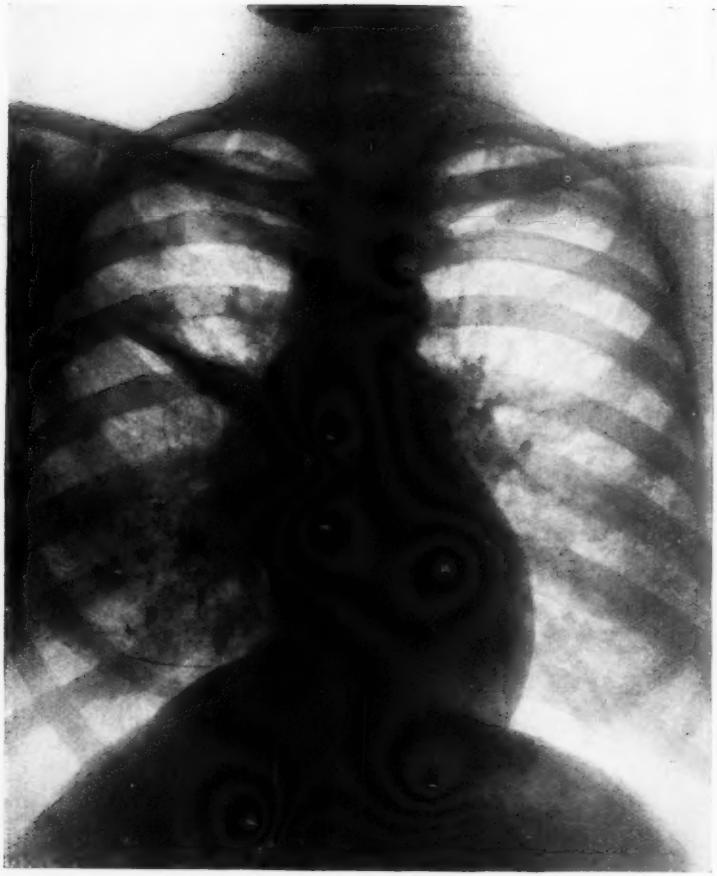

FIG. 2

CHRONIC TUBERCULOSIS IN A GIRL AGED 24, WITH RECENT EXTENSION IN THE RIGHT BASE

The root areas are involved at both sides. The upper interlobar pleura at the right side is thickened. The right highest lobe and the left apex had been active, but were clinically quiescent when the film was taken. There is radiological evidence of some extension in the left base.

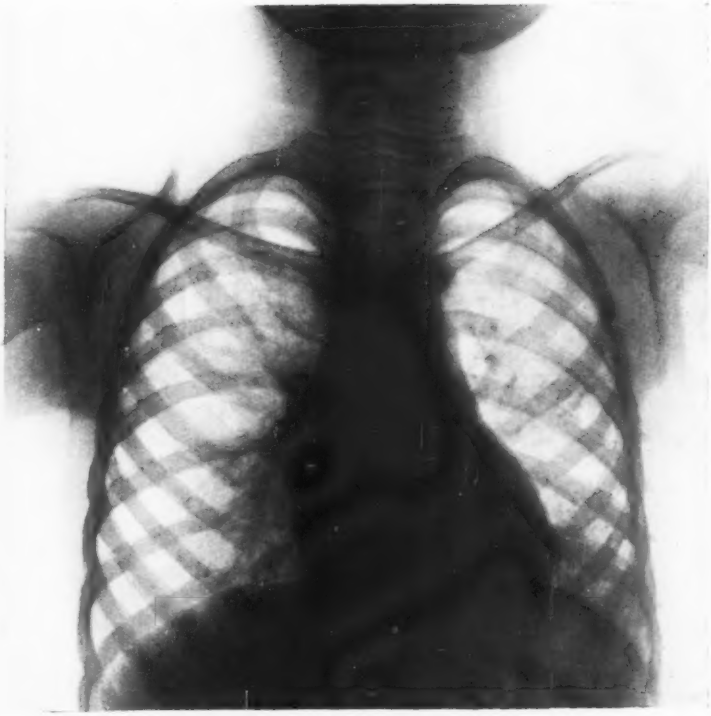

FIG. 3

TUBERCULOUS GLANDS AT THE RIGHT HILUM IN A BOY AGED $6\frac{1}{2}$. A FEW BRONCHO-PNEUMONIC NODULES ARE SEEN IN THE OUTER PART OF THE LEFT LUNG, LEVEL WITH THE ROOT

The right lowest lobe appears to be involved below the root.

FIG. 4

LONG-STANDING TUBERCULOSIS, NOW APPARENTLY QUIESCENT, IN A WOMAN AGED 59, WITH EVIDENCE OF PLEURAL INVOLVEMENT, FIBROSIS, AND CALCIFICATION. THERE IS CURVATURE OF THE SPINE AND DISTORTION OF THE CHEST CONTOUR

necrotic mass is liable to break down, particularly if other infective organisms reach it, and cavitation then occurs. At first there may be a number of broken-down areas, which show as clear bright spots in the dense consolidation, but as these become confluent larger cavities develop. They may be clearly seen, or the surrounding density may render them invisible. If so situated that they drain into a bronchus, they may vary in appearance from time to time according to the amount of fluid and débris they contain. They may show a fluid level. If they cannot drain easily, abscess of the lung and other complications may ensue. The pleura may become involved at any time, and effusions may appear at the bases, or between the lobes, or extending out from the mediastinum. The density of an effusion is fairly uniform; if at the base its upper limit forms a curved line, unless pneumothorax is present, when a horizontal level is clearly seen. In the late stages of tuberculosis there may be enormous cavities and massive collapse following bronchial occlusion.

How does Intra-thoracic Tuberculosis Heal?

Nature's endeavour at healing is evidenced by connective tissue hyperplasia, which undergoes cicatricial contraction. Individual nodules may be encapsulated, or larger areas of the diseased lung may become fibroid, showing a slowly increasing opacity with but little lighting up or expansion on inspiration. Bronchial dilatation is of frequent occurrence; the apex of the lung may be retracted; the hilum may be drawn upward. The capacity of one side of the chest may be lessened; the ribs may become more oblique; the diaphragm may be drawn up. The pleura may be involved in the fibroid change, and if adherent, may pull on the chest wall; the contour of the chest may be altered; the mediastinum, the aorta, or the heart may be drawn out of place. Compensatory emphysema is usually evident in the free parts of the lung, and particularly at the base. Cavities may be involved in the fibroid lung and obliterated; or they may develop smooth thickened walls which show as ring-like shadows with relatively clear centres. The fibrosis is permanent, and can be demonstrated as a reticular shadow at any time. Finally, calcification occurs wherever caseated areas have remained, in individual tubercles, in larger areas, or in glands.

Fig. 4 represents a case of healed tuberculosis. A cavity in the left apex has been involved in cicatricial fibroid tissue. In the lung fields generally there is some degree of fibrosis, with emphysema-like stretching of intervening lung tissue. Displacement of the heart, and thickening of the pleura at the left base, have followed an old effusion. The lateral curvature of the dorsal spine, and alteration in the contour of the chest, result partly from pathological changes and partly from adaptive

physiological efforts to accommodate respiration to altered conditions. Calcification has replaced caseation in many areas.

Other conditions may resemble tuberculosis. In chronic heart disease, particularly in cases with congenital defects, changes may occur giving rise to shadows which cannot be differentiated from those of tuberculosis. Similar appearances may be seen in certain stages of the development of metastatic deposits of slow-growing types of carcinoma. Syphilis of the lung may sometimes be detected by the anomalous distribution of the shadows. Primary neoplasm has often to be considered, the more so as it may occur in a tuberculous patient More acute inflammatory conditions may pass through stages where suggestive shadows are seen, but may be eliminated by the taking of further films after an interval.

But apart from major considerations of differential diagnosis, the reading of films is not easy, and requires considerable concentration of mind. A viewing-box should be used in a darkened room, and there should be no interruption. An opinion given on a film held up to a window for a moment in a hospital corridor is not necessarily of more value than would be the deductions from the use of a stethoscope under similar conditions.

Technique must be good if the film is to be of greatest service. The X-ray tube must not be too hard or detail may be lost. The patient must be in a comfortable position or gross movement may occur. The upright position is preferable for routine work, and it is better for the patient to sit than to stand for all but the shortest exposures. The distance from the anti-cathode to the film should be over rather than under thirty inches. The patient should not lean against the casette, but should just touch it. The use of a heavy current through a soft tube for the shortest possible exposure ensures the greatest uniformity in films, and largely eliminates the blurring effects due to the movements in the lungs which are associated with the pulsation of the heart. Over-development is sometimes responsible for faulty deductions.

This paper is not intended to be dogmatic. It is written with the hope that in it may be found suggestions of use in the study of certain aspects of a disease which provides many of the most difficult problems for the radiologist.

SOME IMPRESSIONS OF THE ANTI-TUBERCULOSIS CAMPAIGN AT HOME AND ABROAD.

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When asked by the Editor to write a short paper giving personal impressions of the anti-tuberculosis campaign abroad, the writer accepted the invitation with considerable diffidence, because, in the first place, views and methods differ widely in various parts of the same country; and, secondly, it is difficult to deal with such a large subject briefly. The remarks which follow refer to Austria, Czecho-Slovakia, Hungary, France, Belgium, England, Holland, and Switzerland, which countries were visited by the writer in 1924 under the auspices of the League of Nations. Every facility was given to study local methods and practices so far as the time would permit.

The Organization of Tuberculosis Work.

In the Continental countries visited, most of the work is achieved by voluntary associations or leagues, which receive subsidies from their respective Governments, and whose activities are, as a rule, subject to some measure of inspection by the officials of the central authority. In England, on the other hand, practically all anti-tuberculosis work is controlled, supervised, and directed by the Ministry of Health, while the campaign is financed by H.M. Treasury and the local rates As a result the legislative enactments dealing with tuberculosis are much more comprehensive in this country, and local action is much more concerted.

Notification of all cases is not compulsory in the other states; in France and Holland there is considerable opposition to notification of tuberculosis in any form, although cases of tuberculosis arising in connection with certain industries have to be reported in Holland. In some countries—*e.g.*, Austria and Belgium—contagious cases only are reported, and such cases are usually only notified when there is danger of the infection spreading to others. In consequence, a relatively small proportion of the cases are known to the local sanitary authorities—at all events, till far advanced. In Switzerland there is no federal law relating to tuberculosis, but some of the cantons have special regulations.

Generally speaking, there is very little co-operation between the tuberculosis section and the other units of the public health service; indeed, in the tuberculosis section itself this is often noticeable as between the various local dispensaries, the hospitals, sanatoria, etc. The co-operation is usually only optional or voluntary, and therefore

frequently in abeyance. The causes of death are, of course, registered everywhere, but the movements of patients to and from institutions are often very imperfectly known to the local sanitary authorities.

The Establishment and Conduct of Tuberculosis Dispensaries.

On the Continent tuberculosis dispensaries are usually organized by the voluntary associations, but some are owned and administered by the municipalities – *e.g.*, a very fine institution at Amsterdam. In other instances the dispensaries form part of the system of health insurance, in which case they are used for the examination and treatment of patients suffering from other diseases as well as tuberculosis.

The amount of treatment given varies greatly. In some places the dispensary is practically an ambulatorium, and medicines, etc., are given on a large scale; whereas, in others, treatment is either not given at all, or is limited to artificial pneumothorax—*e.g.*, at the Léon Bourgeois Dispensary in Paris something like one hundred persons were attending Dr. Rist's clinic as out-patients for "refills" at the time of our visit.

Whole-time tuberculosis officers are quite the exception, but the principle is favoured, particularly as regards administrative work. The employment of general practitioners on a part-time basis is not regarded as satisfactory, owing to the fact that local jealousies arise. Throughout France, with the exception of Alsace and Lorraine, a uniform system of "case records" prevails.

The Rôle of the Sanatorium.

For the most part sanatoria are owned by the voluntary associations, insurance societies, philanthropic bodies, etc. Free sanatorium treatment, as given in England, is unknown, but the cost of maintenance is defrayed by the "Krankenkasse," or "Caisses," voluntary associations, or the patient (in whole or in part). The accommodation is frequently graded into first, second, and third classes, according to the means of the patients. The nursing arrangements in England compare favourably with anything seen abroad, where "religious sisters" are still frequently employed. In many of the sanatoria, especially those for children, the nurses sleep either in the wards or in small rooms adjoining and overlooking the wards.

A notable feature is that countries which have mountainous areas—*e.g.*, Austria, Czecho-Slovakia, and Switzerland—favour treatment of both pulmonary and non-pulmonary tuberculosis at high altitudes. Belgium and Holland each maintain a sanatorium in Switzerland. A change from a sanatorium at low level to one in the mountains, or *vice versa*, is regarded as of great value when possible.

France has an exceptional number of beds in marine sanatoria for

surgical cases; the lack of accommodation for these patients in special institutions in England is very noticeable.

The Service of Special Tuberculosis Hospitals.

While the hospital-sanatorium is growing in favour, there are still relatively few hospitals specially devoted to the treatment and isolation of cases of pulmonary tuberculosis. Most of the public or state hospitals, however, have special wards or annexes for tuberculous patients. Generally speaking, there is plenty of accommodation, and the standard is very high. All classes are catered for, and the third corresponds more or less to our Poor Law infirmaries, where treatment is free.

The hospitals of Austria, Czecho-Slovakia, and Hungary command the admiration of all; they are well built, splendidly equipped, and thoroughly up to date. In these institutions the teaching facilities are excellent, and an enormous amount of research work, both clinical and pathological, is carried out. It is interesting to note that in Vienna, during the year 1923, 56·5 per cent. of the deaths from phthisis occurred in the local hospitals.

The Diagnosis of Tuberculous Cases.

While tuberculin is now relatively little used in England for diagnostic purposes, it is still extensively employed abroad. The skin reaction of von Pirquet is usually practised; a very simple method of inunction of a specially concentrated tuberculin, advocated by Professor Hamburger of Graz, gives satisfactory results, and, of course, does away with the necessity of scarification. Subcutaneous injections of tuberculin are usually only given when the cuti-reaction is negative.

The Röntgen rays are almost universally used abroad; the larger dispensaries usually have large and powerful installations, while the others make arrangements to have their patients examined either by private specialists or in institutions. In France and Belgium, mobile X-ray units are employed in country districts. Much work has been done on the X-ray pathology of the lung, and the evolution of the various types of lesions are carefully studied.

The Treatment of Tuberculous Patients.

While rest in the recumbent position is a more prominent feature in the "cure" abroad than in England, the value of the work of Marcus Paterson, at Frimley, is generally recognized. Movements are afoot in Austria, Holland, Switzerland, and France to form colonies or settlements on the Papworth model for quiescent and arrested cases of pulmonary tuberculosis.

Except in Holland, treatment by artificial pneumothorax is increasing in popularity everywhere, and thoracoplastic operations and phrenicotomy are being more and more practised.

Tuberculin is still extensively used for treatment in Central Europe, and apparently to a less extent in Belgium also.

Heliotherapy is employed for surgical cases wherever this method is feasible; artificial ultra-violet radiation as a substitute entirely, or in dull weather only, is used in all the larger institutions, and is regarded as a very valuable method of treatment. Both natural and artificial sunlight are frequently utilized in cases of tuberculous laryngitis, the rays being directed on to the affected part by the patient himself by means of a system of mirrors.

Methods and Measures for Prophylaxis.

Social insurance, by enabling the working classes to secure prolonged and efficient treatment, is undoubtedly of great value. Some form of "insurance" was in being in all the countries visited except France. In Alsace and Lorraine the pre-war system is also retained.

While most of the efforts in France, Belgium, and elsewhere on the Continent are devoted to the protection of the children and the preservation of health in the earlier years of life, it is noteworthy that relatively little attention is paid, officially at all events, to the bovine bacillus in milk as a source of disease in the human subject.

The wonderful record of the Grancher Foundation is well known; more recently Professor Léon Bernard and Dr. Debré have introduced a new "system," in which the children are separated from the parents at birth and taken to a crèche and fed artificially; when they are seen to be thriving, they are sent to special centres or depôts in the country, and eventually boarded out in healthy peasant families till the age of four years—*i.e.*, until they have passed through the period during which they are most susceptible to infection. Many preventoriums for delicate children exist, particularly in France; one at Hendaye, near Biarritz, accommodates more than 650 children.

Holiday camps, convalescent homes, day camps (in which patients are treated on sanatorium lines during the day and return to their own homes to sleep), open-air schools of various types, etc., are widely utilized for children of school age; respiratory exercises and physical training are usually a prominent feature of the regimen. It was stated that during 1923, from Vienna alone, 100,000 children were sent to 100 convalescent homes. Rest or day camps are also used for adults in some cities—*e.g.*, the Hague and Vienna.

The voluntary associations on the Continent are extremely active in the direction of propaganda, with a view to instructing the public in health matters, arousing interest in the anti-tuberculosis crusade, and also to secure the necessary financial support. Numerous illustrated posters, many of them very well designed and some of them beautifully executed, are freely displayed. Popular films, health plays, press

articles, lectures, etc., are other means employed. Each of the national associations publishes a popular journal dealing with tuberculosis.

In France and Czecho-Slovakia prominence is given to post-graduate teaching in tuberculosis, and special courses have been organized for those who intend to take up anti-tuberculosis work. In order to improve the nursing service, special training courses for health visitors have been instituted in France and Holland.

When it is mentioned that the death-rate from all forms of tuberculosis in 1923 per 10,000 of population was 39·40 in Budapest and 33·14 in Prague (old city), as contrasted with 9·93 in Amsterdam and 11·60 in London, the need for the application of preventive measures in Central Europe will be obvious.

While the British statistics are the most complete, it is unfortunate that the age periods used do not correspond with those employed abroad. Thus, our ten-yearly periods are reckoned from midway in one decade to midway in the next—*e.g.*, 35 to 45 years—whereas abroad the various decades are used—*e.g.*, 30 to 40 years—so that it is impossible to make a true comparison of statistics. Of course, this difficulty can easily be overcome by setting out the deaths, etc., in periods of five years instead of ten. With reference to prevention, certain anomalies call for remark. One school holds that insufficient nourishment is the chief predisposing cause of tuberculosis, but the disease is stated to be on the increase in the rural districts of France and Hungary, where food is relatively abundant and cheap. Another school maintains that the lack of sunshine is a predominant factor; but the tuberculous mortality is lowest in Holland, Belgium, and Britain, all industrial countries with more or less atmospheric pollution and damp, foggy climates, and all liable to long spells of cloudy weather, particularly in winter. Sheffield is notorious for its smoke, but has the lowest tuberculosis death-rate of the large towns of Britain.

In conclusion, it may be stated that while the funds available for anti-tuberculosis work are much greater in England, a much larger proportion of them is spent on treatment of definite cases of pulmonary tuberculosis in this country, whereas, in the Continental countries, attention is principally focussed on prevention and the care of delicate and predisposed children.

THE PRETUBERCULOUS CHILD.

By ARTHUR MASSEY,
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The term "pretuberculous," applied to the young, conveys significance shrouded in vagueness. A pretuberculous child might be provisionally taken to denote one whose environment or physical condition renders uncommonly likely the subsequent development of tuberculosis. It must be that some children whose history and physique suggest the pretuberculous state do not in fact ever develop frank tuberculosis. Again, some children become patent victims of the tubercle bacillus who have not apparently betrayed previously any signs of their special susceptibility; such cases are not common. Doubtless there exists a broad class of children who are capable of selection from among their fellows to be classified as "delicate"; it remains to be seen whether the pretuberculous child can be differentiated with any precision from this wider group. In approaching the task, it is necessary to draw up a series of observations on a child, certain or all of which will warrant pretuberculous categorization. The general adoption of some recognized line of approach would permit of some uniformity in selection of cases; suitable treatment of such cases, calculated to prevent the onset of frank disease, would ultimately yield rich fruit to the State.

Some Aspects of Early Tuberculosis in Children.

The practical study of early tuberculosis of the chest in early life emphasizes the difficulty of diagnosis. An intermediate stage between pretuberculosis (as generally interpreted) and frank tuberculosis must often be recognized in the shape of "suspected tuberculosis." The term "pretuberculous" must be made to include the latter; hence "pretuberculous" comes to mean not a condition prior to the onset of tuberculosis, but prior to the appearance of diagnosable tubercle. In its extended sense, then, a study of the pretuberculous conditions should include a survey of the earliest forms of tuberculosis in children—at the risk of anomalous nomenclature. Space will hardly permit of dealing with such a wide subject as early tuberculosis, but certain features may here receive cursory mention. Enlargement of bronchial glands—not infrequently a legacy of measles or pertussis—is an important indication of the pretuberculous condition. According to Parrott's Law, there is no affection of the lung without concurrent affection of the adjacent lymph nodes and *vice versa*. Calmette[1] would appear to favour the

[1] Calmette: "Tuberculosis in Man and Animals," p. 176.

view that the bronchial glands are the initial offenders. It is well known that Ghon[1] described primary lung foci in children; howbeit in a large proportion of cases, it is probable that the bronchial glands constitute the site of initial tuberculous infection in the chest. The writer inclines to the view that latent tuberculosis of bronchial glands, without apparent lung involvement, is commoner in early life than is generally supposed. It is of importance, then, to determine the presence of bronchial adenitis. In this connection, it is unfortunate that in the X-ray picture, the bulk of the bronchial glands—unless grossly enlarged—comes within the scope of the median shadow. It must be remembered, however, that normally the right tracheo-bronchial nodes may lie just outside the border of the median shadow, and that "the right broncho-pulmonary glands in young children lie at the edge of the median shadow in the pulmonary field, at a level with the junction of the upper and lower cardiac arches."[2]

Of the many clinical signs that have been described as indicative of bronchial adenitis, perhaps that of D'Espine is the most valuable; that authority attached much importance to the points in the mid-line of the back where true tracheal bronchophony is heard, the latter being characterized by "a post-phonal quality in which the final sound persists for a fraction of a second after the whispered voice ceases."[3] This sign is eminently practicable; the typical sounds are heard normally on auscultation over the seventh cervical vertebra in young children, and as low as the second dorsal vertebra in older children. Definite tracheal bronchophony heard at least two vertebræ below the normal sites is strongly in favour of bronchial adenitis and of pretuberculosis.

In regard to chronic cervical gland enlargement in children, other definite causes having been excluded, such children might be regarded as pretuberculous when (i.) there is history of tuberculous environment, (ii.) there are debility, underweight, chronic catarrh, or "bronchitis," and (iii.) there is evidence of the tuberculous disposition.

In regard to pulmonary tuberculosis in childhood, physical signs are usually of little value until the disease is well in progress; bronchial adenitis must, however, be regarded as a potential precursor of this condition.

A positive tuberculin reaction in a child under five years of age is of great value in determining a very early tuberculosis. In older children, a positive reaction may mean the presence of tuberculous infection not necessarily active. A negative cutaneous reaction in older

[1] Ghon: "The Primary Lung Focus of Tuberculosis in Children," p. 180.
[2] Abt: "Pediatrics," vol. v., p. 586.
[3] Gittings, Knowles, and Ashurst: "Lectures on Tuberculosis in Infancy and Childhood," p. 123.

children probably denotes freedom from tuberculous infection; in younger children it would only appear to indicate absence of actual activity.

The Pretuberculous Condition.

It is apparent that the practical interpretation of the pretuberculous state is a wide one. An approach to its meaning must be made along two broad avenues—viz., (*a*) that of family history and environment, and (*b*) that of physical condition. (*a*) The importance of infected environment is paramount, although the importance must vary with the degree of poverty and overcrowding in the home. A child who has lived long in close contact with tuberculosis, in poor surroundings, must, regardless of physical condition at the time—unless unfortunately frank disease is already established—be placed in the pretuberculous category. It is not possible to be so dogmatic about the child of tuberculous family whose environment is such as ample means and care can confer. (*b*) The physical condition of the child: At the outset it must be admitted that it is not always possible to differentiate the pretuberculous child from his "delicate" brother; this must be done as far as possible, however. What is here needed is some standard as a guide in earmarking the pretuberculous, and the writer suggests that the following groups come into the category in question:

(I.) Children with definite tuberculous family history—not by reason of hereditary infection, but because of the almost inevitable post-natal environmental infection.
(II.) Children who have been in close contact with any case of active phthisis for a considerable period—these are mostly included in Group I.
(III.) Children who have been notably debilitated since an attack of another disease—above all, measles and whooping cough.
(IV.) Children with suggestive symptoms, but in whom early tuberculosis cannot be diagnosed, unless, perhaps, by specialized investigation—such children should be referred to suitable sources of such investigation.
(V.) Children with the tuberculous disposition.

The pretuberculous standard is yet girt by some of the vagueness which, of necessity, characterizes the subject. What is the tuberculous disposition? Group II. will merge into Group I.; Group I. will include a good proportion of Group V.; Groups III. and IV. are not difficult of interpretation. There remains, then, the type of children who are eligible for classification by reason of certain physical characteristics. It is a debatable question whether those appearances which constitute the "habitus phthisicus" denote special susceptibility, or whether they indicate rather the outward manifestation of tuberculosis already established; if the latter, the recognition of the characteristics to be mentioned and the treatment of the child

exhibiting them become still more urgent. Hippocrates noted that the form of body peculiar to phthisical subjects "was the smooth and whitish, that resembling a lentil," and "with scapulæ having the appearance of wings."

Two broad types of conformation have been described, viz.: (*a*) the tuberculous, with bright eyes, oval face, thin skin, narrow nose, and long thin bones; (*b*) the scrofulous, with heavy figure, thick lips, opaque skin, large hands, and large thick bones. The typical picture of a child with the tuberculous diathesis might be thus painted: the child is often "beautiful," the skin is fine, dry, and delicately tinted; the eyes possess unusually clear sclerotics, and are surrounded by long silky lashes; the eyebrows are usually high and arched; the hair of the scalp is soft and long. In the writer's experience, the teeth are often above the average in respect of quality and soundness. The throat is injected and tonsillar abnormality common; the palate may be pale, high, and narrow. The neck is often long, thin, and pointing forwards, with prominent larynx, and palpation will reveal more or less enlarged cervical glands. The chest may display any of those deformities which go to make the phthinoid type—*i.e.*, its contour may be flat or alar; it is usually thin and exhibits prominent superficial veins. There may be excessive growth of hair in the mid-line of the back. The arms are often long and thin; the hands exhibit large interphalangeal joints; hyperextension is common at the metacarpophalangeal joints. General nutrition may be subnormal or anæmia present. The history may be, for example, that the child "has always been delicate" or "has never been right since measles or whooping cough." This picture may or may not be framed by a tuberculous family history. This description is exaggerated, inasmuch as it is uncommon to see a child exhibiting the whole combination of typical appearances. Past history of disease will often influence selection—notably in regard to measles, whooping cough, and catarrhal conditions in general, where subsequent debility has been marked. In regard to repeated "colds," a history of which is often cited as indicative of tuberculous suspicion, only a resultant protracted refractory cough can justify such apprehension. "When coryza is persistent, however, and produces a chronic dermatitis of the alæ nasi and upper lip, it becomes suggestive of tuberculosis if diphtheria is excluded."[1] It is evident that, in selecting pretuberculous children, individual opinion and clinical instinct must come into play, and that it is not possible to lay down rigid rules governing selection.

[1] Gittings, Knowles, and Ashurst: "Lectures on Tuberculosis in Infancy and Childhood," p. 49.

A New Definition of the "Pretuberculous" Child.

At this stage a new definition of the pretuberculous child is suggested—viz., one who, by reason of tuberculous family history and contact, of past debilitating disease, or of present physical condition, is unusually likely to become the victim of active tuberculous disease; in addition the term is extended to include those children in whom the presence of tuberculosis is already suspected, but whose condition will not admit of precise diagnosis.

General Conclusions.

Some criteria by which the pretuberculous child is selected have been given. The study of school medical records for past years of children who are now suffering from pulmonary tuberculosis suggests that in most cases the incidence of the disease might reasonably have been foreseen. Conversely, such investigation shows that many of those children who in past years exhibited suggestive signs and appearances have, in fact, subsequently developed tuberculosis in diagnosable form. Theoretically it is likely that, had proper treatment of the child commenced at the pretuberculous stage, many cases of later frank disease would have been prevented. It is remarkable "that, in the conduct of the anti-tuberculosis campaign, measures for systematic study, organized prophylaxis, and adequate treatment of tuberculosis in early life have hitherto received but little attention."[1]

It would appear that, in the hope of a decreased incidence of tuberculosis, we must look to preventative rather than curative medicine; the period of childhood offers great scope for fruitful work in this connection. Having marked down the pretuberculous child, we know that he should be removed from an environment of infection, adequately nourished and clothed, and subjected at the legal age to open-air schooling. The relentless obstacles of economy, prejudice, sentiment, and practicability, which shut off such ideals, require no description; but much can be done on these lines, and, in the doing of it, courage may be taken from the fact that the mortality from tuberculosis is alling.

[1] Kelynack, T. N. (Editor): "Tuberculosis in Infancy and Childhood," p. 1. London: Baillière, Tindall and Cox. 1908.

HABITAT IN PULMONARY TUBERCULOSIS: A COMMENTARY ON DR. W. GORDON'S STATISTICS.

By F. R. WALTERS,
M.D., M.R.C.P.,
Physician to the Crooksbury Sanatorium.

In the January number of the British Journal of Tuberculosis, Dr. W. Gordon restates his views on the adverse effect of strong prevalent rain-bearing winds on recovery from phthisis, and cites, in addition to his own statistics, those of Dr. Brownlee, Sir Leonard Rogers, and some other observers. Before we draw conclusions of a practical nature from these statistics, it would be well to compare them with the clinical facts derived from a study of patients in sanatoria and elsewhere, and to attempt an explanation based upon physiological facts.

That damp houses and damp soil hinder recovery from pulmonary tuberculosis has long been known to those engaged in the study of the disease. Such places have been avoided from the early days of sanatorium treatment, if not earlier. Strong wind is also generally recognized as unfavourable, so that all the important early sanatoria were placed in situations with good shelter against wind from trees or rising ground. Places that are very much shut in, so as to prevent the free circulation of air, have been found to be undesirable.

As we have to consider ambulant cases as well as those confined to bed, the effect of rainy weather has also to be taken into account. The good results obtained under the late Dr. Otto Walther at Nordrach Colonie, where heavy rain is common during part of the year, show that with adequate precautions this need be no bar to recovery. I need not refer here to the influence of altitude and sunshine, although they are of considerable importance.

My personal experience is largely derived from patients treated at the Crooksbury Sanatorium. This is exceptionally favoured in several respects, being placed on a sunny southerly slope, at a good elevation for a non-Alpine sanatorium, on a soil which dries very rapidly after rain, and with good shelter against wind. Comparisons between results obtained at different sanatoria are full of fallacies, as there are so many different factors concerned; but useful evidence may be derived from a study of the effects of different kinds of weather. Patients confined to bed are more comfortable, and appear to make better progress, in moderately cool weather, and in warm weather with

a gentle breeze. They dislike "muggy weather," with much atmospheric moisture and little movement in the air, and they also dislike extremes of heat and cold, especially when these come on rapidly. Fortunately in this part of England it is unusual to have great extremes; we are better off in this respect than some of our American friends. In sultry weather appetite fails and the tendency to fever increases; cold still weather often causes an initial loss of weight, usually followed by improved appetite, less fever and better progress. Patients kept in bed seldom or never "catch cold" unless they are visited by those suffering from infectious catarrhs; nor is pleurisy common among such patients when the weather becomes ungenial.

Ambulant patients who go out for prescribed walks in wet or cold weather do not suffer therefrom, provided that reasonable precautions are observed. Even if their clothes get wet they do not "catch cold." To give one instance out of many: A lady who was a patient during raw and unpleasant spring weather, who had been extremely subject to cold catching at home, did not once suffer in this way while here. On one occasion she was caught in a heavy rainstorm, but did not change her wet clothes, so as not to sacrifice her prescribed hour of rest before lunch, covering herself warmly with rugs instead. Her husband, who had come to visit her, was in similar case: neither of them suffered in any way. Still, I think it advisable to change wet clothes when possible, and this is usually done.

How can we explain these facts? Healthy people differ in their power of reacting to cold and wet. Some can bathe in the Serpentine after breaking the ice, whereas others are chilled after a cold sponge. Phthisical patients are for the most part more sensitive to chilling influences than the healthy. Consumptives often get subnormal mouth temperatures in cold weather; a cold wind chills them to the bone unless adequately protected. On the other hand, those who are liable to slight febrile attacks suffer disproportionately in this respect during hot weather. Phthisical patients under ordinary home conditions are extremely subject to cold catching, dependent upon imported infection, household dust, and chills caused by the contrast between hot rooms and cold outside air. Strong wet winds chill the body much more than windless conditions; moreover, an ambulant phthisical patient finds more difficulty in breathing in the teeth of a strong wind, and is more easily fatigued in windy weather. Wet clothes are perceptibly heavier than dry ones; and this again increases the exertion.

On the other hand, Professor Leonard Hill has shown with his katathermometer the importance to health of moderate variations in temperature and movement of the air. In "muggy weather" appetite, digestion, circulation, and nutrition are all somewhat depressed; so that absolutely windless places, if they exist, would be good neither for

the healthy nor the phthisical. Moisture in the air intensifies the effect of both heat and cold.

Conclusions may be drawn from the foregoing as regards the individual patient and as regards sanatoria. For the individual patient we should minimize the effects of extremes by adequate precautions, both when there is strong wind and in wet weather. To a considerable extent the skin can be trained to react better against cold and wet weather. In many continental sanatoria this is done by hydrotherapy; but it can also be done without special apparatus by other sanatorium methods; and it is better to attempt such education than to shut the windows or keep patients indoors. Fresh air still remains one of the most potent means of restoring the phthisical to health. Ventilation is more often disregarded in the homes of the people than otherwise. To the healthy this may matter but little; to the tuberculous it is of vital importance. In my experience it is far more often the habits that are at fault than the actual means of ventilation.

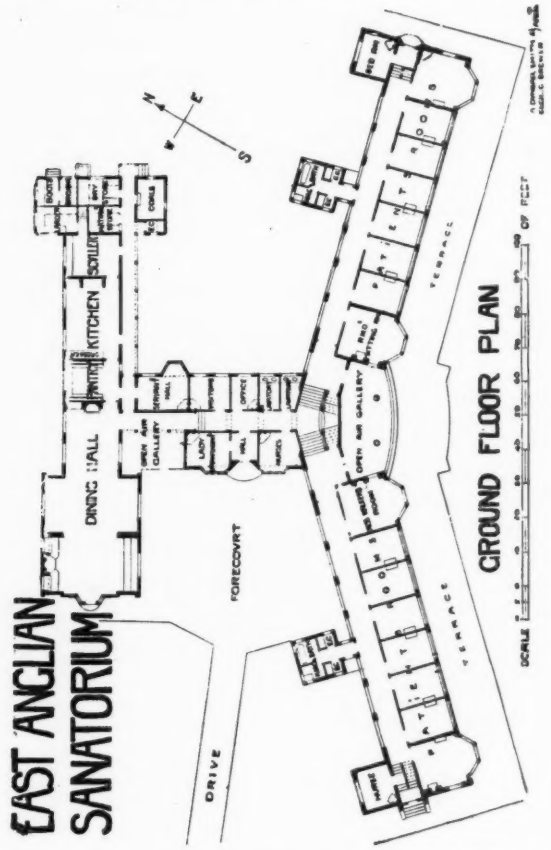
As regards sites for sanatoria, places exposed to strong winds are not advisable; and if adequate shelter cannot be provided artificially, the results will not be good. Places on the coast—*pace* Professor Hill—will need very careful scrutiny; for there are few such that are not at times liable to gales of wind or to sea fogs. A cliff behind the sanatorium gives it shelter against a direct wind, but not against an oblique one.

So far I am in agreement with Dr. W. Gordon; but I do not think his evidence justifies the conclusion that personal exposure to strong wet winds out of doors predisposes to phthisis. This is much too sweeping a statement. Healthy people, even if infected with tubercle (as most people are) run less risk of becoming consumptive if they go out freely in all kinds of weather, than if they stay indoors when it is wet and windy, whether they inhabit an exposed locality or a more favoured one. Those engaged in sedentary occupations indoors are known to be especially liable to consumption. As regards those who already show signs of phthisis, stormy exposed places are best avoided; but even there the evil can be largely avoided by adopting the rules and precautions customary in good sanatoria. Nature can be corrected by art and science.

ASSOCIATIONS AND INSTITUTIONS.

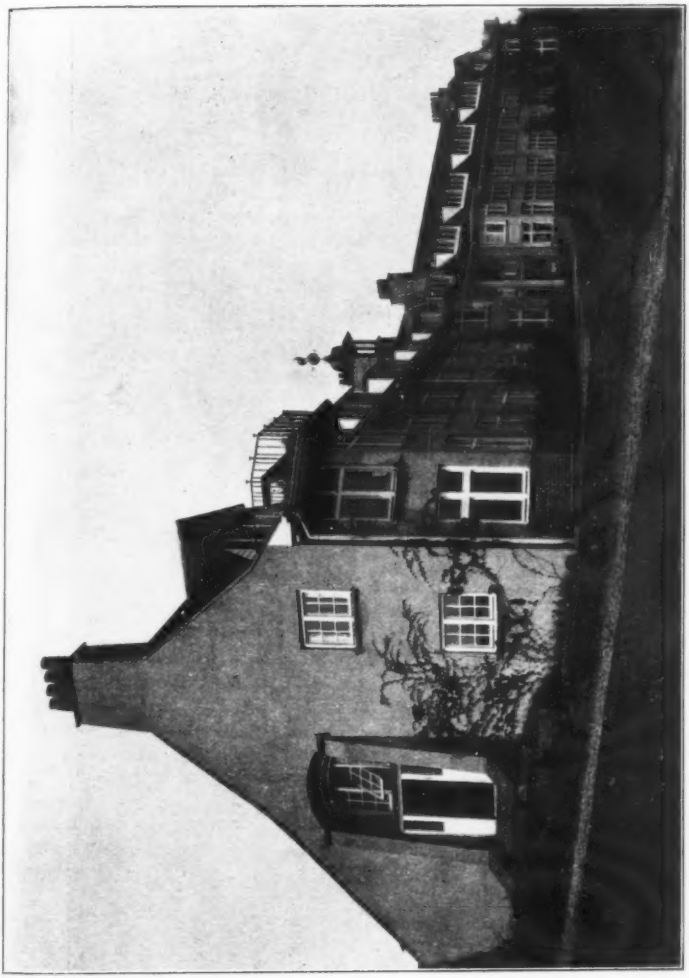
THE EAST ANGLIAN SANATORIUM AND OTHER INSTITUTIONS AT NAYLAND, SUFFOLK.

THROUGH the vision and enterprise of Dr. Jane Walker there have been established during the past twenty-five years at Nayland in



Suffolk a fine group of institutions for the treatment of all classes of tuberculous subjects. The East Anglian Sanatorium, Nayland, was

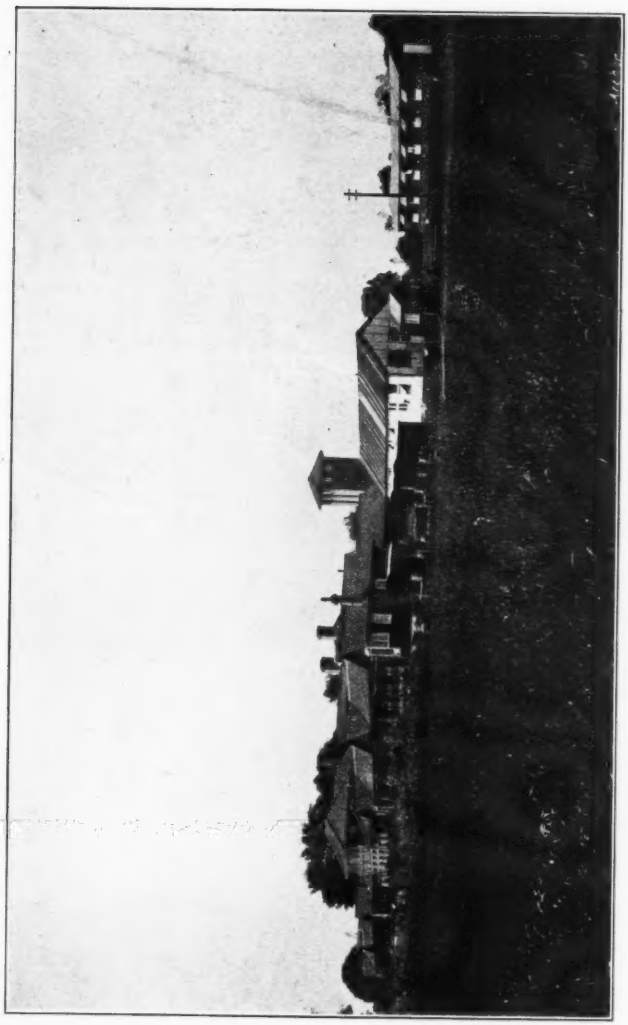
opened on January 22, 1901. The same organization had been at work at Downham Market and Denver in Norfolk for the previous nine years. The building was specially designed and constructed to



EAST ANGLIAN SANATORIUM: GENERAL VIEW OF THE MAIN BUILDING.

accommodate thirty-five patients, and from time to time has been enlarged as occasion required. In 1904 sixteen beds were provided in a separate building on another part of the estate, and opened for women patients of the poorer classes. Somewhat later a similar building, also

containing sixteen beds, was provided for men of the same class. The beds for both men and women have been increased from time to time, and at the present there are sixty beds for women and forty for men.



EAST ANGLIAN CHILDREN'S SANATORIUM: GENERAL VIEW.

There is also a sanatorium and school for 100 children. Altogether there is in the institution as a whole provision for from 235 to 240 patients. The estate consists of 350 acres, and allows for the carrying

out of the numerous activities. Ex-patients are trained in gardening, poultry rearing and egg production, pig farming and general farming. Men are also trained in estate and rural carpentry, and during the time of the working of the Government scheme for training ex-service men disabled with tuberculosis, skilled instructors taught watch and clock repairing, jewellery making and repairing, furniture construction and repairing, polishing, and upholstery. This scheme came to an end in June, 1925, and now the section dealing with jewellery still keeps on and turns out some most beautiful work. The carpentry department is now used for giving instruction on the lines of occupational therapy to men patients. The watch and clock workshop is the centre of a very active handicraft department, where patients are taught raffia work, slipper making, embroidery, leather work, etc. In addition to these industrial developments, there is a very flourishing toy-making department, which turns out very good work. The institution has its own bakery, general shop, and boot-repairing section, all run by ex-patients. The plan of taking ex-patients on the staff has been followed since the inception of the scheme, and at the present time out of a working population of 150 connected with the sanatoria, more than 100 have been patients either at Nayland or elsewhere. Their health is no more precarious than is that of the other workers; indeed their incidence of sickness is less than that of the non-tuberculous staff. These ex-patients are selected on account of their suitability for the work allotted to them and also for the reliability of their characters; and this method might well be followed in other similar institutions.

NOTICES OF BOOKS.

THE MAKING OF A SANATORIUM.

Dr. L. Guinard, of the Sanatorium Bligney, near Paris, has issued a volume in what may be designated an Edition de Luxe concerning general considerations relating to the work carried out by all sanatoria for the treatment of tuberculosis, and having special reference to the experience of twenty years' service at Bligney sanatorium.[1] The book, as Dr. Guinard points out, is primarily intended to be a recognition of the part played by the benefactors in the establishment of the institutions at Bligney, and the fine part which this well-known centre has taken in the great fight against tuberculosis by the French people. Dr. Guinard has treated the subject in such a way as will appeal to all classes of thoughtful people, although it will be mainly of interest to doctors. All concerned with matters of public health, including physiologists, architects, and donors, as well as organizers, administrators, and directors of sanatoria and similar institutions of public service will find this work of exceptional interest. Many medical practitioners and others visit sanatoria and ask many and varied questions—some intelligent and some not. To all such enquiries Dr. Guinard has sought to provide satisfactory answers, and throughout the volume there is constant evidence of patient and thorough explanation. The work of the sanatoria began in 1903, and the management was vested in an administrative council, working in connection with a committee in Paris. The sanatorium for men was opened in 1903, and the one for women in 1909. The latter institution was further enlarged in 1912 up to 150 beds, a unit which Dr. Guinard regards as the ideal for an establishment providing for the treatment of patients suffering from so chronic an illness as tuberculosis, where of necessity they remain for a long time, and where they must make friends with their fellows and regard the place as their home during the period of residence. There is little in the account of this institution at Bligney that differs from that of an ordinary well-managed sanatorium in this country, and to describe it in detail would be superfluous. But if it could be conceived that a person had never heard of a sanatorium, and was desirous of erecting and conducting one upon the best modern lines, he could not do better than thoroughly study this weighty tome, for no details, however small and unimportant, are left undescribed. All the classical items, such as rest, superalimentation, exercises, fresh air, and the like, are fully dealt with. At Bligney the bath-rooms and annexes are apparently placed very conveniently, but really considering the length of the corridor from the furthest bed to the annexe, about 100 feet, it is not so close after all, and two sets of bath-rooms in each corridor would have been better. Dr. Guinard's fine work in French is altogether a most interesting and valuable book; we venture to think that it would have been impossible

[1] "La Pratique des Sanatoriums, Conditions Hygienique et Techniques de Construction, d'Organisation et de Fonctionnement—Direction Médicale et Administrative—Reglementation des Cures—Soins Spéciaux—Résultats d'Après les Vingt Premières Années d'Exercice des Sanatoriums de Bligny. Par L. Guinard. Pp. 312; 31 illustrations dans le texte et 32 planches hors texte. Lyon: Société Anonyme de l'Imprimerie, A. Rey, 1, Rue Gentil. 1925. Price 60 francs.

to find any British publisher who would have undertaken a similar enterprise for any English or Scotch sanatorium.

JANE WALKER, M.D.

TUBERCULOSIS OF THE HIP.

The paucity of textbooks on special manifestations of non-pulmonary tuberculosis in this country is almost as striking as the plethora of such works in other countries, and we welcome the appearance of this small, concise, and cleverly written book from so able and enthusiastic an expert as Mr. Girdlestone.[1] Mr. Girdlestone's work at the Wingfield Orthopædic Hospital at Oxford is well known and confers on him special authority for the task he has undertaken. In his preface he states that the subject of his book is purely clinical, and it has been written with the hope of helping to find for each tuberculous hip patient the safest and most direct road for securing a safe and permanently useful limb. In this aim he has achieved no small measure of success. Part I. of the volume has been devoted to diagnosis. This is eminently practical and its value is enhanced by admirable skiagrams. In it the author's leanings are clearly indicated, for he advises that the doctor "if in doubt should ring up the Orthopædic Hospital and send the patient along, prepared to stay if necessary." The value of the special Orthopædic Hospital is rightly stressed, but it may be questioned whether it is so essential as the author would have us believe. Part II. deals with treatment and affords a clear exposition of the author's own practice. There is an excellent and helpful discussion on the end result sought, and especially the consideration whether we should aim at a *movable* or a *fixed* hip well repays perusal. Part III. is devoted to an assessment of end results, and is rendered particularly valuable by reference to illustrative cases. The excellent skiagrams especially command admiration. The book concludes with a useful appendix on the mechanics of the hip-joint. Altogether this is a useful monograph which can be confidently recommended to tuberculosis officers and medical men generally who are interested in this aspect of tuberculous disease. In his effort to secure brevity the author has perhaps curtailed too much. Some will regret that he has largely restricted himself to methods employed in his own practice. We might reasonably ask for more extended reference to the management of abscesses so frequently associated with tuberculous disease of the hip-joint. Fig. 27, described as a modified "Marsh" extension, gives no hint as to the special purpose for which it was designed and the special indications for its use, omissions which will doubtless be rectified in subsequent editions. The indications for celluloid in splinting are not alluded to. While it may be justifiable for the author to confine himself largely to methods he employs, the value of the book would have been increased had some attention been directed to other methods of treatment which have been proved of value. In spite of these shortcomings, which it may be hoped will be rectified in the future, the book as far as it goes is thoroughly good, and may be recommended with confidence as well worthy of study. Its value is greatly enhanced by the exceptionally fine series of illustrations.

H. J. GAUVAIN.

[1] "The Diagnosis and Treatment of Tuberculosis of the Hip." By G. R. Girdlestone, B.M. (Oxon), F.R.C.S. Pp. 94, with 60 illustrations. London: Humphrey Milford (Oxford Medical Publications), Oxford University Press. 1925.

PULMONARY TUBERCULOSIS.

Professor Klemperer, of Berlin, has written a concise manual intended for practising physicians.[1] Microscopical and histological details are dealt with briefly, but an unusual amount of space is devoted to the discussion of the various theories and more or less speculative views concerning the origin and evolution of pulmonary tuberculosis in the adult. Under the section of ætiology a fair review of such controversial questions as the portals of entry of the tubercle bacilli into the body and their mode of spread is included. Prominence is given to the views of Ranke concerning the separation of tuberculous infection into primary, secondary, and tertiary stages, the last of which includes practically all pulmonary tuberculosis in adult life. Great stress is placed upon the use and value of the Roentgen rays in diagnosis, and among the illustrations are some very good reproductions of plates appearing in Gräff and Küpferle's work, showing the various types of lesion—productive, exudative, and fibrotic (or cirrhotic). While Professor Klemperer does not agree with all the views of Gräff and Küpferle, he recognizes the extreme value of their contributions. Their scheme of dividing the lungs into upper, middle, and lower fields is also illustrated. The author deals fully with the difficult question of nomenclature, and the classifications of Bacmeister, Aschoff-Nicol, and Turban are given in tabular form. Practically one-fifth of the book (forty-three pages) is devoted to "specific treatment." While Klemperer regards tuberculin as a useful adjunct in treatment, he states unhesitatingly that the Friedmann vaccine is no cure for pulmonary tuberculosis. As this is the third edition of a work which first appeared in 1920, the book evidently enjoys great popularity. It has already been translated into Russian, Spanish, and Hungarian. An English edition would certainly be of great value, for it gives an authoritative exposition of views and theories not found in English works, and its perusal cannot fail to broaden the outlook of those specially interested in tuberculosis. While most of the references are to the work of Central European writers, this is an excellent manual to read in conjunction with a British book such as that of Sir James Kingston Fowler.

W. H. Dickinson, M.D., M.R.C.P. (Ed.).

PULMONARY TUBERCULOSIS.

A new edition of Dr. Leon Bernard's excellent work on Tuberculosis of the Lungs is available. The book is one of considerable interest.[2] It is a series of studies, not only on the clinical and social aspects of the disease, but on those conditions closely allied to pulmonary tuberculosis such as are often ignored. The author raises many highly controversial questions. For instance, in connection with child-birth in tuberculous cases one feels that his favourable views are influenced unduly by the declining birth-rate in France. At the same time, bearing in mind the Malthusian doctrines that are now spreading everywhere,

[1] "Die Lungentuberkulose ihre Pathogenese, Diagnostik und Behandlung." By Professor Felix Klemperer, Medical Director of the Municipal Hospital, Berlin-Reinickendorf. Third edition. 231 pp., with 16 illustrations in the text and 9 plates. Berlin N. 24: Urban and Schwarzenberg, Friedrichstrasse 105 B. 1925.

[2] "La Tuberculose Pulmonaire." By Léon Bernard. Second edition. Paris: Masson et Cie. 1925. Price 28 fr.

the philosophy that "at least one has the child," as Dr. Bernard puts it, is quite worth considering. The book is uneven in quality, too much stress being laid on classification, but the chapters on Prognosis and Artificial Pneumothorax are excellent. There are no illustrations. The inclusion of chapters on such common diseases of the chest as emphysema and chronic bronchitis, and also affections of the upper air passages in their relation to phthisis, gives the book a balance which many more pretentious volumes lack.

MARGARET CARNEGIE SIMPSON, M.B.

THE DIFFERENTIAL DIAGNOSIS OF PULMONARY TUBERCULOSIS.

The last volume of Dr. Neumann's ambitious work calls for congratulations.[1] The author has set out to do one thing, namely, to define the early stages of tuberculosis in the adult, and he has not allowed himself to be side-tracked on the way. This is the third volume of the series. The first two dealt with the disease from the clinical and the pathological points of view, and this volume deals with the differential diagnosis. All this is very much worth doing, but there are very few people who would have undertaken it. This particular book, although it is not well written in parts, should be read by everyone, if only as a form of penance for sins of omission and commission in the diagnosis of tuberculosis. The varied collection of pathological conditions simulating this disease which the writer parades before us has a most disconcerting effect on one's peace of mind. If the book does no more it will at least give us pause to think of such things as atelectasis, scoliosis, syphilis, and so on in early cases with a negative sputum. In these days of specialists one is encouraged, both by the attitude of the patient and by the literature on the subject, to forget that lung tissue is as liable to most of the ills that flesh is heir to as the other tissues of the body. The book is well indexed and there is an excellent bibliography.

MARGARET CARNEGIE SIMPSON, M.B.

THE SURGERY OF PULMONARY TUBERCULOSIS.

Drs. Brunner and Baer have written a monograph which, as the sub-title shows, is a critical review of the surgical aspects of pulmonary tuberculosis; it is based on personal experience and is written from both the surgeon's and the physician's points of view.[2] Part I., prepared by Brunner, deals with the indications and results of operative treatment. The technique of the various operations is not dealt with. The object the author had before him is to show on what types of cases surgical treatment can be of benefit, to the extent either of improving the general health and lessening symptoms, or of obtaining permanent healing of the disease. The advantages and disadvantages of the various methods, together with the indications and contraindications,

[1] "Die Klinik de Beginnenden Tuberkulose Erwachsener." Bd. III.: Das Heer der nicht Tuberkulosen Apizitiden und der Falschlich sogenannten Apizitiden. By Dr. Neumann. Pp. 176, with 72 illustrations. Bd. I.-III.: Meinen Gangleinenband Gebunden. Schilling 51, German Mark 30. Wien: Verlag Julius Springer, 1, Scholteng, 4. 1926.

[2] "Die chirurgische Behandlung der Lungentuberkulose." By Dr A. Brunner and Dr. G. Baer. Pp. 67, illustrated. Berlin: Julius Springer, Linkstrasse 23-24. 1925-1926. Price, Reichsmark 3.60.

are fully discussed. The great possibilities which surgical treatment offers to the patient with pulmonary tuberculosis are emphasized by the tables showing the excellence of results actually obtained; at the same time, full attention is drawn to the risks and to the limitations of the various procedures. Brunner voices the recent school of thought that artificial pneumothorax, even if possible, is not always preferable to thoracoplasty, and that there are occasions when the major operation should take precedence over the minor procedure. In this he is supported even by Baer, who in Part II. considers the same subjects, but from the point of view of the "internist." There is an excellent chapter by Brunner on the treatment of effusions occurring in the course of pneumothorax treatment. Baer ends by saying about the surgical treatment that the results already obtained are so amazing that one can from them glimpse the mighty progress which is being achieved in the treatment of pulmonary tuberculosis. Despite the tendency to redundancy in the second half of the book, the work provides a concise, clear, and helpful account of the present-day situation of the treatment of pulmonary tuberculosis by surgical means.

H. MORRISTON-DAVIES, F.R.C.S.

THE SPUTUM.

Professor Heinrich von Hoesslin, of Berlin, has just issued a second and revised edition of his monumental work on Sputum.[1] It was first published in 1920. This volume is not a clinical manual but a work of reference for the pathologist and bacteriologist. The material is arranged under such headings as physical and chemical qualities, macroscopic and microscopic appearances, and so on. Only in the bacteriological section are the appearances dealt with under the heading of definite organisms, so that the work as a whole is more suited to one who would answer the question "What are the characteristics of this sputum and what do they mean?" than for the physician who wants at once to know "Is this tuberculous?" Professor von Hoesslin discusses every quality from specific weight to cholesterin content, and every infection from staphylococcal to echinococcal, but his writings under "Tuberkelbacillen" will be of interest to readers of this journal. Noteworthy is the summary of different concentration methods. Methods of staining are of course fully discussed. The illustrations of the tubercle bacillus, like those in other divisions of the work, are beautifully printed, and avoid, as a rule, the diagrammatic and misleading clearness to which delineators of such subjects are often tempted. The bibliography extends over fifty pages.

ISABEL G. H. WILSON, M.B., CH.B.

SURGICAL TUBERCULOSIS IN CHILDHOOD.

Professor John Fraser has just issued in two handsome volumes, elaborately illustrated, a magnificent treatise on the Surgery of Childhood,[2] and worthily dedicated to Sir Harold Stiles. The Regius Pro-

[1] "Das Sputum." By Professor Dr. Heinrich von Hoesslin. Second edition. Pp. x+400, with 130 illustrations. Berlin: Verlag von Julius Springer. 1926. Price, Reichsmark 60.

[2] "Surgery of Childhood," by John Fraser, M.C., M.D., Ch.M., F.R.C.S.E., Regius Professor of Clinical Surgery in the University of Edinburgh; Consulting Surgeon to the Royal Hospital for Sick Children, Edinburgh. In two vols. Vol. I.:

fessor of Clinical Surgery in the University of Edinburgh explains in his preface that the work has had its foundations in lectures and cliniques at the Edinburgh Royal Hospital for Sick Children. Professor Fraser has been fortunate to secure the co-operation of friends and colleagues, and has produced a model exposition of present-day pediatric surgery. This monumental production deals with all forms of deformity and disease calling for surgical aid, and provides an eminently practical work which should be available for all students and practitioners called to deal with surgical affections in infancy and childhood. And throughout the volumes are evident everywhere the thought and the actions of a master mind. A feature calling for special thanksgiving is the admirable collection of photographs of actual cases. There are also numerous excellent X-ray photographs. Professor Fraser's fine work is of special interest to all students of tuberculosis in childhood. The author throughout his professional life has devoted much attention to the various surgical manifestations of tuberculosis in early life, and in both the volumes before us there are authoritative studies on tuberculosis of bones, joints, glands, etc. Professor Fraser says "onlookers are invariably impressed by the large percentage of the surgical work of children which is concerned with tuberculous lesions. It is a frequent experience to find that in the surgical wards of a children's hospital in this country from 30 to 40 per cent. of the cases are under treatment because of the same form of tuberculous disease. If a high proportional incidence, therefore, means anything, tuberculosis is the most important surgical ailment of childhood. The disease has other aspects, however, even more sinister than its prevalence—the prolonged course, the pain and the suffering, the crippling and disfigurement which so often follow, the liability to recurrence, and in so many cases the fatal issue which ensues in spite of treatment. Much has been done in the elucidation of the problem of tuberculous infection; the results of treatment are steadily improving, the incidence of the disease is said to be declining, yet the problem remains one of the most insistent with which we have to deal." The author claims that "the bovine bacillus is a special menace to the child in contrast to the adult in a proportion of 36 to 17·3 per cent." With regard to the resistance of the child to tuberculosis the following statement appears. "From the evidence which we possess it seems that a period corresponding to the second and third years of life is the time when the natural resistance of the child is at its lowest. Thereafter the child attains to a varying degree of immunity, possibly by means of a series of minor infections." A section is devoted to the treatment of surgical tuberculosis by heliotherapy and actinotherapy, and considerable attention is directed to tuberculin-therapy. We earnestly commend Professor Fraser's suggestive and informing volumes to the thorough study of all medical advisers dealing with children, and particularly surgeons engaged both in general and orthopædic practice, and also all tuberculosis officers responsible in any way for the early diagnosis and prompt and effective treatment of surgical tuberculous lesions in children.

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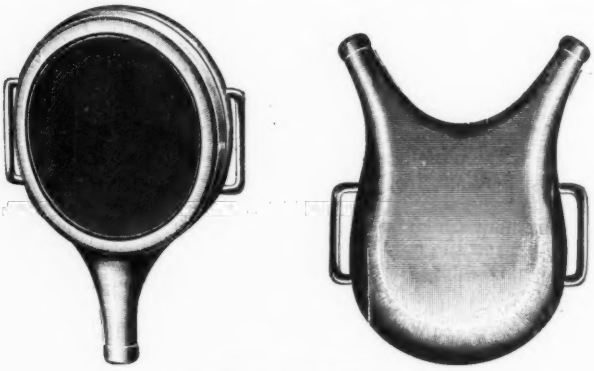
pp. viii+1-604, figs. 1-332, chapters i.-xxviii.; Vol. II.: pp. iii+609-1152, figs. 333-598, chapters xxix.-xxxix. London: Edward Arnold and Co., 41 and 43, Maddox Street, W. 1926. Price 42s.

PREPARATIONS AND APPLIANCES.

DR. MINCHIN'S STETHOSCOPE.

DR. MINCHIN'S STETHOSCOPE has found favour with many physicians. A new model has recently been introduced.[1] The chief advantage in this simple, compact, and effective stethoscope lies in the fact that the receiver or auscultatory diaphragm is so set that, unlike in most stethoscopes, it can be applied to the patient's chest without giving rise to difficulties in regard to dress, attitude, or general position. If required the heart can be auscultated with the patient in the prone position. The new model, as is indicated in the accompanying figures, has side-loops



DR. MINCHIN'S STETHOSCOPE.

which enable the sphygmomanometer to be fixed when blood-pressure estimates are being made.

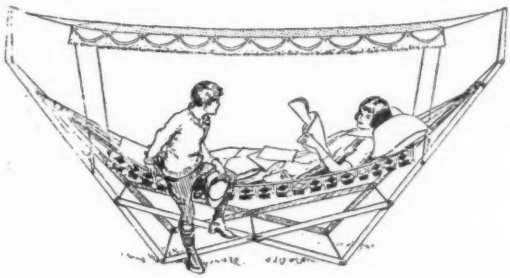
Dr. Minchin's chest-pieces offer various advantages, and will be of service to tuberculosis officers and others having to deal with chest cases. Practitioners dealing with infants and children will find these chest-pieces of much practical advantage.

HYGIENIC APPLIANCES AND THERAPEUTIC PREPARATIONS.

Rest is one of the first and most essential elements in the care of the majority of tuberculous patients. But rest must be regulated and supervised and carried out under open-air conditions with a minimum

[1] Full particulars regarding Dr. Minchin's stethoscope may be obtained on application to the inventor at Invicta House, Marine Parade, Sheerness-on-Sea, Kent. The stethoscope can be obtained at all medical and surgical instrument makers. The price of each chest-piece is 10s. 6d.

of trouble and a maximum of comfort. Many forms of reclining couches and hammocks have been devised, but in most of these there are points which leave much to be desired. Our attention has recently been directed to the "GONDOLA" OPEN-AIR RESTING HAMMOCK, the main features of which are indicated in the accompanying figure.[1] It offers many advantages: easy adjustment, mobility, rigidity, durability, freedom from ground fixings and other lashings, and great comfort in actual use. The hammock, moreover, has a pleasing appearance, and can be moved about even by a child. One of these delightful hammocks can be seen in use at the Children's Sanatorium of the National



THE "GONDOLA" OPEN-AIR RESTING HAMMOCK.

Children's Home and Orphanage at Harpenden. This hammock is one of the novelties in which Mr. J. J. Bailey, F.R.H.S., L.D.S., House and Gardens Sundries, Ltd., Chichester House, Chancery Lane, W.C. 2, is specially interested. In our lastissue we directed attention to certain of the inventions of Mr. Bailey likely to be of service in sanatoria work and to all engaged in horticultural activities. At this time of the year many of our readers would find Mr. Bailey's ingenious and effective "Everyman's Seed Sower" (price 1s.) simply invaluable.

BRONZE LETTERED VERSE STONE.

Gardens in connection with sanatoria and open-air schools should be made as beautiful and as instructive as possible. And a particularly attractive way in which the charms of a garden may be increased is by the use of VERSE STONES.[2] Messrs. Conway and Cooper have favoured us with a specimen of one of these charming novelties. It can now be seen in the rock-garden of the open-air school of the Children's Sanatorium at Harpenden, a branch of the great National Children's Home and Orphanage, which has centres for its 4,000 little folk in many parts of the country. The accom-

[1] The Gondola Hammock is manufactured by the Home and Garden Sundries Company, Ltd., Botolph House, 10, Eastcheap, E.C. 3, from whom full particulars can be obtained on application.

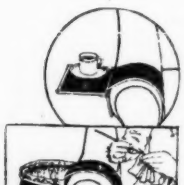
[2] Particulars and prices regarding the Verse Stones may be obtained on application to Conway and Cooper, Hollis Croft, Sheffield.

THE SPADE-SCRAPER.

panying figure indicates better than any description the delight of this clever artistic construction. We understand that these verse stones have gone to various parts of the world, and now decorate panel gables, rockeries, conservatories, and small lawns. We particularly commend them to country gardens where sick folk and children are to be found.

Every sanatorium and open-air school should possess one or more of Major C. Van Der Byl's SPADE-SCRAPERS.[1] These are ingeniously constructed spades, which provide means for the effective cleansing of dirty boots, and thereby save much trouble and labour by preventing the incursion of mud into house and passages. Major Van Der Byl has also introduced a desirable companion in the form of a Spade Boot Brush.

Miss Molly Haigh has favoured us with a specimen of one of her cleverly constructed, artistic, and novel FOOT SCRAPERS.[2] "Scottie" is a strong wrought-iron scraper, having long spikes for fixing in ground or concrete. These quaint, charming foot scrapers are ideal for country houses where children dwell. We have sent "Scottie" to the open-air school of the Children's Sanatorium at Harpenden, where he may be seen any day fulfilling a valuable mission in his dog's life. This entirely supersedes the old type of round brush with a pole, as it is raised off the damp ground on three little feet which prolong its life, and you can get the toe and sides of the boot underneath the bristles, thus enabling the whole of the foot to be wiped perfectly clean whilst standing in an easy position.



THE KLION TRAY AND WORK-BAG.

The KLION TRAY is a novelty which will be of special interest to invalids, and should appeal to those who have to spend time resting in the open or elsewhere.[3] It is a simple adjunct for the armchair, thereby providing desk, shelf, or book-rest. Women will welcome the work-basket and work-bag shapes.

Many shelters, open-air schools, and private rooms used for tuberculous children and consumptive patients experience considerable difficulty in providing means for heating, the boiling of water, and the conducting of simple cooking, which, while effective, should not be expensive. In meeting many of these cases valuable help may be obtained by the use of the cleverly constructed "ARDENT" STOVES.[4] The chief features of these long-approved appliances are indicated in the accompanying illustrations. The "Ardent" Stove possesses considerable heating power, and is

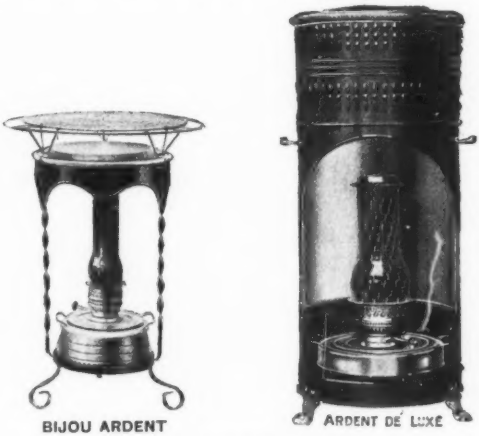
[1] Major C. Van Der Byl will be glad to forward particulars of his clever invention on application being made to him at Wappenham, Towcester, Northants.

[2] "Scottie" (price 19s. 6d.) can be obtained from the designer and producer, Miss Molly Haigh, 389A, High Street, Cheltenham.

[3] Particulars of the Klion Tray Novelties can be obtained on application to Klion Trays, 44, High Street, Wanstead, E. 11.

[4] Particulars regarding the various forms of "Ardent" Stoves can be obtained on application to the manufacturers, Dixon and Sepulchre, 36, Duke Street, Houndsditch, E.C. 3.

one of the most reliable oil-burning stoves on the market. The expenditure is low, while the power provided is high. There is a remarkable freedom from unpleasant smell. For use in cases of



THE "ARDENT" LAMPS.

sickness, where gas and electric fires are not available, the "Ardent" is invaluable. All forms of simple cooking can be carried out on this inexpensive and most practical stove.

Hot-water bottles are essential appliances in all forms of nursing, and are specially desirable in effective and convenient varieties for tuberculous subjects undergoing open-air treatment. The Hospital Contracts Co, Ltd., are now providing excellent "COLFARGAR" ALUMINIUM HOT-WATER BOTTLES which for cleanliness, durability, and effectiveness cannot be excelled.[1] They are of British construction, body stamped and in one piece, and solid drawn, and are fitted with an improved stopper which eliminates all danger of leakage. These bottles are available in round and flat shapes, and having capacity of three and two pints. The prices are 5s. 6d. and 3s. 6d., post free.

THE "COLFARGAR" ALUMINIUM HOT-WATER BOTTLE.

The "KENSAL" Series of Glass Sprays provide reliable, convenient, and inexpensive means for the application of medicaments to the nose

[1] Particulars regarding the Aluminium Hot-Water Bottles can be obtained from the Hospital Contracts Co., Ltd., 33-35, Mortimer Street, W. 1.

and throat. They are free from corrosion and clogging, and can be readily and effectively sterilized. One of the most convenient of the series is the "KENSAL" COMBINED NASAL IRRIGATOR AND ATOMISER, the chief features of which are shown in the accompanying figures.[1] It

THE "KENSAL" COMBINED NASAL IRRIGATOR AND ATOMISER.

provides an admirable means for the cleansing of the mucous membranes of the nasal passages, preparatory to systematic treatment by specific medicaments. The price is 4s. 6d.

Garlic has for long years been advocated as an agent of service in the treatment of tuberculosis. Under the designation of "ALLISATIN" there has been recently introduced, in tablet form, a garlic preparation which is said to be free from all objectionable secondary effects.[2] According to the work of Professor E. Roos it would seem probable that Allisatin may be advantageous in some cases of intestinal tuberculosis.

"TENASITINE"[3] is designated a "Universal Adhesive," and is certainly a clean, reliable, convenient preparation for producing a firmly cemented union between almost any class of surfaces. It is put up in handy metal tubes, and is an agent which will be appreciated, not only in hospitals, sanatoria, and open-air schools, but in laboratories, museums, and wherever scientific and practical work is being carried out.

Dr. Katharine Gamgee has devised a serviceable Case Sheet for use in Artificial Light Treatment Centres, containing a weight chart and a blood chart.[4]

[1] Full particulars regarding the "Kensal" Series of Glass Sprays can be obtained on application to John Bell and Croyden, Ltd., incorporating Arnold and Sons, 50-52, Wigmore Street, W. 1.

[2] "Allisatin" is supplied by the Sandoz Chemical Co., Ltd., Canal Road, Bradford, Yorks.

[3] "Tenasitine" and other varieties of cements are manufactured by Kay Brothers, Ltd., St. Petersgate Mills, Stockport.

[4] The Case Sheets for use in connection with Artificial Light Treatment are published by H. K. Lewis and Co., Ltd., 136, Gower Street, W.C. 1. Price 1s. 6d. a dozen; 50 for 5s.; 100 for 9s.; 250 for £1.

THE OUTLOOK.

TUBERCULOSIS RESEARCH.

TUBERCULOSIS is a world-wide menace to the health and happiness of mankind, and in many countries valuable investigations are being carried out with a view to the discovery of improved methods and new means for dealing with tuberculosis in man and animals. In connection with the work of the Committee of the Privy Council for Medical Research at the National Institute for Medical Research, Hampstead, N.W. 3, a number of Investigation Committees exist. There is one for Tuberculosis, of which Captain S. R. Douglas, M.R.C.S., F.R.S., is chairman, and another for the Bacteriology of Tuberculosis, of which Professor Georges Dreyer, C.B.E., M.D., F.R.S., is chairman; Dr. A. S. MacNalty acts as secretary. There are also Committees dealing with Radiology and Biological Actions of Light. The last Report of the Medical Research Council contains matter of special interest to students of the Tuberculosis Problem.[1] Parliament provided a grant-in-aid of £135,000. Earl Balfour is the Lord President, and Sir Walter M. Fletcher, K.B.E., M.D., Sc.D., F.R.S., the Secretary of the Council. In the section dealing with Tuberculosis reference is made to a number of researches relating to bacteriological and serological studies. A record is provided of the results obtained by the Tuberculin Committee in their investigations of tuberculin tests in cattle. Many will be specially interested in the paragraphs dealing with the effects following the use of Professor Möllgaard's sanochrysin. The section dealing with the Biological Actions of Light contains data of value and references to recent articles. The statement appears that "The bactericidal power of the blood was found to rise after exposure to light, in confirmation of the work of other observers; but this change is relatively transient. These and other observations give fresh basis for the view that excessive dosage of light is harmful. The 'phase of depression' following excessive exposure to light has been studied both in cases of surgical tuberculosis and in non-tuberculous orthopædic cases. Observations are also being made of the fate of tubercle bacilli implanted into blood-plasma."

LIGHT AND HEALTH.

The nature and action of light and other forms of radiant energy are being increasingly studied and applied in their relation to the preservation of health and the prevention and arrest of disease. Among recent works on the subject we would direct special attention to an elaborate volume written by Messrs. Luckiesh and Pacini.[2] This pioneer book

[1] Report of the Medical Research Council for the year 1924-25. Pp. 164. London: H. M. Stationery Office. 1925. Price 3s. 6d.

[2] "Light and Health: A Discussion of Light and Other Radiations in Relation to Life and Health." By M. Luckiesh, Director Lighting Research Laboratory, National Lamp Works of General Electric Co., and A. J. Pacini, Director Department of Biophysical Research, Victor X-Ray Corporation of General Electric Co. Pp. viii + 302, with illustrations. Baltimore, U.S.A.: The Williams and Wilkins Company. British Agents: Baillière, Tindall and Cox. 1926. Price 22s. 6d.

on the action of light on the human subject is the most complete, up-to-date, and scientific work yet available in the English language, and may be sure of an enthusiastic welcome on both sides of the Atlantic. The authors have presented ascertained data in a form peculiarly free from needless technical terms, and have ventured on various conjectures and explorations in a way which makes their elaborate treatise as fascinating as a romance. The work opens with an exposition of the nature of light and radiation, and is followed by chapters on Climate and the Human Race and Light and Life. Then come chapters providing detailed studies of the action of light on the blood, glands, skeleton, muscles, nerves, and viscera. There are also chapters on Light and Infection, Light and Hygiene, Light and the Senses, Physiological Effects of Light, and Lighting for Health and Happiness. Heliotherapy and Actinotherapy are proving invaluable in dealing with various forms of tuberculosis. The authors refer to the pioneer work of Rollier, Finsen and others. Much valuable advice is offered regarding the management of tuberculous cases. Reference is made to the value of ultra-violet radiation in lupus. The whole work is of exceptional interest, and will appeal not only to medical advisers, physiologists, hygienists, and all engaged in duties relating to personal and public health, but can be read with pleasure and profit by thoughtful men and women desiring information and guidance regarding the rôle of light in developing and maintaining vigorous life and combating morbid conditions making for death. Attention may be directed to a novelty which we would commend to the notice of publishers in this country. The Williams and Wilkins Company, who issue this handsome volume, give the names of the printing craftsmen who have participated in the production of the book.

"MODERN SUNLIGHT."

We are glad to welcome a new periodical devoted to the exposition of sunlight in its natural and artificial forms.[1] It is issued as an independent scientific journal, and yet is sufficiently popular to make it of interest and service to all thoughtful men and women desirous of securing reliable information regarding the development of radiations, not only in their hygienic and medical aspects, but also in industrial activities. The first number contained articles of special value to medical advisers, including particulars regarding the light baths at the London Hospital; pictures of children undergoing actinotherapy at Alton; ozonizers in use at The Infants Hospital, Westminster; and monkeys basking in artificial sunlight at the Zoo. There are numerous articles by well-known authorities, and many communications descriptive of the progress of heliotherapy and actinotherapy. The journal, we understand, will also devote a section to Smoke Abatement. We wish this new journalistic enterprise the success it deserves.

[1] *Modern Sunlight* is published monthly by The Sunlight Bureau, Oswaldestre House, Norfolk St., Strand, W.C. 2, price 2s. each number, post free. Annual subscription, £1 1s., post free.

NOTES AND RECORDS.

Lieut.-Colonel Fremantle, in the House of Commons, recently asked the Minister of Health whether tubercle bacilli in milk were killed by sterilization or pasteurization as generally carried out; and whether he was aware of any means of killing tubercle bacilli in milk other than by sterilization or pasteurization. Mr. Neville Chamberlain replied as follows: "I am advised that pasteurization carried out in accordance with the procedure laid down in the Milk (Special Designations) Order confers a very substantial protection against infection by tubercle bacilli. It is probable that the process commercially described as sterilization affords similar protection, and that this is true in a smaller degree of other methods of treating milk by heat. I am not aware of any other practicable means of killing tubercle bacilli in milk." Colonel Fremantle also asked the Minister of Health the proportion of milk estimated to be tuberculous from analysis of samples in London, Birmingham, Manchester, Edinburgh, Leeds, Liverpool, Plymouth, Cardiff, Hull, and Newcastle, respectively. Mr. Neville Chamberlain provided the following statement regarding a number of samples of milk taken in certain towns in England and Wales during 1924 for examination for tubercle bacilli and number found to be tuberculous:

Place.	Samples taken.	Samples tuberculous.	Percentage tuberculous.
London (City)	39	5	12·8
London (County)	2,400	121	5·0
Birmingham	303	26	8·6
Manchester	590	48	8·1
Leeds	68	1	1·5
Liverpool	781	79	10·1
Plymouth	11	2	18·2
Cardiff	53	1	1·9
Kingston-upon-Hull	18	nil	nil
Newcastle-upon-Tyne ...	220	7	3·2
—	4,483	290	6·5

Dr. Watts asked the Minister of Health the total amount expended on the provision of sanatoria for the treatment of tuberculosis in England and Wales; the annual cost of upkeep; the number of cases treated; and the percentage of cures claimed. Mr. Neville Chamberlain replied: "The total capital expenditure incurred by local authorities in England and by the King Edward VII. Welsh National Memorial Association on the provision of residential institutions for the treatment of tuberculosis is approximately £4,400,000; the annual cost of the residential treatment of patients under the tuberculosis schemes of local authorities in England and Wales is approximately £2,312,000; and the average number of cases under treatment at any one time is approximately 18,850. As regards the last part of the question, I

regret that no figures are at present available for the country as a whole, but I may refer my hon. friend to the report issued by the Medical Research Council (Special Report Series, No. 85) as to patients treated in the Frimley Sanatorium.

The Joint Tuberculosis Council has issued a circular giving particulars of post-graduate Courses on Tuberculosis during the present year. (1) Professor S. Lyle Cummins, Principal Medical Officer of the Welsh National Memorial Association, will hold an intensive post-graduate Course on Tuberculosis, April 12–17, limited to ten members. Fee, three guineas. (2) An intensive post-graduate Course on Tuberculosis, of one week's duration, will be held in London with visits to hospitals outside London, April 19–24. Fee, three guineas. Among those taking part are Dr. Burrell, Mr. Tudor Edwards, Dr. Beaumont, Dr. Bosanquet, Dr. Stanley Melville, Dr. Agassiz, Dr. J. H. Sequeira, Dr. Colbeck, Dr. Gloyne, Dr. Clive Riviere, Dr. W. G. Pugh, and Dr. Chandler. (3) Sir Robert Philip, Professor of Tuberculosis in the University of Edinburgh, will hold an intensive post-graduate Course on Tuberculosis in Edinburgh, May 17–22. Sir Robert Philip will be assisted by Edinburgh colleagues. The Course will include Demonstrations: Clinical (at the several Edinburgh Institutions—sanatorium, hospital for advanced cases, colony, dispensary, hospital for non-pulmonary tuberculosis, Royal Infirmary, Tuberculosis Clinic, etc.), Pathological, Experimental, etc. The Course will be limited to twenty members. Fee, three guineas. (4) Dr. S. Roodhouse Gloyne will hold a post-graduate Course on the Bacteriology and Pathology of Tuberculosis, at the City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, London, May 31 to June 12. The Course will be limited to six members. Fee, two guineas. (5) Sir Henry Gauvain will hold a Course on Non-Pulmonary Tuberculosis, at Alton and Hayling Island, June 21–26. The Course will be limited to ten members. Fee, three guineas. (6) A study tour in Norway is being arranged by the Joint Tuberculosis Council for July, 1926. The party will probably be limited to twenty members. It is at present proposed to leave Newcastle on July 10, arriving at Oslo on July 12. A stay of three to four days would be made in Oslo studying Tuberculosis work and Institutions in that city. On July 15 and 16 it is proposed to visit the south-eastern part of the country (motor-cars) to study Tuberculosis Institutions and Tuberculosis in that part. On July 18 the party will probably go over the mountains to Finse and then to Bergen, where two days will be spent studying Tuberculosis there. The party will probably arrive back at Newcastle on July 23. The arrangements in Norway are in the hands of Professor Harbitz, of the University of Oslo, and Dr. Heitmann, the Chief State Physician for Tuberculosis. The Ministry of Health have under consideration the question of this Course ranking for grant. (7) Mr. G. R. Girdlestone will hold a Course on Non-Pulmonary Tuberculosis at the Wingfield Orthopædic Hospital, Oxford, on September 23, 24, and 25. Fee, one and a half guineas. (8) Arrangements have been made whereby individuals can pay study visits to Institutions. One or two men or women can, if they desire, study for a week or longer at an Institution. It is hoped this will permit of individual study needs being met to some extent. The following Institutions have agreed to give facilities for such study during 1926: East Anglian Sanatorium,

Nayland (Dr. Jane Walker); Brompton Hospital Sanatorium, Frimley (Dr. Wingfield); King George V. Sanatorium, Godalming (Dr. James Watt); Highwood Hospital for Children, Brentwood (Dr. Agassiz); and the Victoria Sanatorium, Davos Platz (Dr. Bernard Hudson). The Minister of Health has intimated approval of these Courses, and all the British Courses will rank for grant. The question of the Foreign Courses ranking for grant is at present under the consideration of the Minister. All applications and inquiries should be sent to the Hon. Secretary, Joint Tuberculosis Council, Post-graduate Courses, at 19, Brunswick Square, Camberwell, London, S.E. 5.

The next diploma examination of the Society of Superintendents of Tuberculosis Institutions will be held on May 5. Particulars, application forms and schedule (price 2d.) may be obtained on application to the Hon. Secretary, Dr. J. R. Dingley, Darvell Hall Sanatorium, Robertsbridge, Sussex.

The Tuberculosis Society (the hon. Secretary of which is Dr. F. J. C. Blackmore, The Tuberculosis Dispensary, Maxey Road, Plumstead, S.E. 18) has arranged for the following gatherings: May 7, Clinical Evening at Brompton Hospital kindly arranged by the Dean—Dr. Maurice Davidson; June 6, a visit to a Tuberculosis Institution.

The National Association for the Prevention of Tuberculosis, 20, Hanover Square, London, W. 1, will this year hold its Annual Conference in Glasgow, July 1–3. The chief subjects for discussion will be (1) Provision for the Care of Non-Pulmonary Forms of Tuberculosis; (2) The Actual Place and Function of the Tuberculosis Dispensary in the Tuberculosis Scheme. An Evening Reception will be given by the Right Hon. the Lord Provost of Edinburgh. The Conference is open to all persons interested in tuberculosis on payment of the fee of one guinea, either as delegate or private member. Railway tickets to Glasgow from all parts of Great Britain will be available at a single fare and a third from June 30 to July 5.

L'Association Alsacienne et Lorraine contre la Tuberculose in association with the Faculty of Medicine of the University of Strasbourg is arranging for a Cours de Perfectionement sur la Tuberculose Pulmonaire et les Malaides des Voies Respiratoires, October 8–23. Particulars on application to Dr. Vaucher, 22, rue de l'Université, Strasbourg.

At the first American Congress of Public Health to be held in Atlantic City, U.S.A., May 17–22, Tuberculosis will be one of the chief subjects for discussion.

At the Bristol Congress of the Royal Institute of Public Health, May 18–24, certain aspects of the Tuberculosis Problem will be discussed. Particulars on application to the Secretary, Royal Institute of Public Health, 37, Russell Square, W.C. 1.

In connection with the twenty-first international post-graduate course at Vienna, June 14–27, there will be a special section dealing with tuberculosis. Particulars from Dr. A. Kronfeld, Porzellangasse 22, Vienna, IX.

An examination for the Tuberculous Diseases Diploma (Wales) will be held at Cardiff on dates as follow: *Thursday, July* 1, 10 a.m. to 1 p.m., Pathology and Bacteriology, written and practical; 2 p.m. to 5 p.m., Written Examination on Tuberculosis. *Friday, July* 2, 10 a.m. to 1 p.m., Examination of Medical Cases of Tuberculosis; 2 p.m. to

5 p.m., Clinical and Oral on Medical Tuberculosis. *Saturday, July* 3, 10 a.m. to 1 p.m., Examination of Cases of Surgical Tuberculosis; 2 p.m. to 5 p.m., Clinical and Oral on Surgical Tuberculosis. Full particulars may be obtained on application to the Memorial Offices, Westgate Street, Cardiff.

The Davos Third Post-Graduate Vacation Course, dealing generally with the subject of Tuberculosis and Alpine Climate, will be held August 22–27, and will comprise lectures and demonstrations by the medical residents. The lectures will be given in French and German, but arrangements are being made for certain lectures and demonstrations to be conducted in English. It is hoped that many English medical practitioners will avail themselves of this opportunity of visiting Davos, and of seeing the work which is being accomplished there. In former years the course has been largely attended by Continental medical advisers and students, and it has been regretted that the attendance of English visitors has been but small. Dr. Bernard Hudson, the Victoria Sanatorium, Davos-Platz Grisons, Switzerland, will be glad to supply any information.

The Council of the Carlo Forlanini Foundation have announced that a prize of ten thousand lire is offered for an original work on the pathological anatomy or pathogenesis or treatment of pulmonary tuberculosis. Particulars can be obtained on application to La Direzione dell' Ospedale Maggiore, Milano, Italy.

At Leysin there is a Sanatorium for Swiss undergraduates, and now a Sanatorium for French university students suffering from pulmonary tuberculosis is to be erected at Petites Roches, near St. Hilaire de Touvet in the Isère. The Sanatorium will contain 130 beds, including 25 for female students. We could wish that a similar institution might be avaliable for British students.
